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US 5096082 A US 4681238 A

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(54) Abstract Title
A container including a non-resealable closure device and an auxiliary sealing device

(57) A container includes within it an auxiliary sealing device 20 with a sealing member 26 for sealing an opening 18 after removal of a non-resealable closure device 19. The auxiliary sealing device has retaining means 27 operable from outside the container after the non-resealable closure device has been opened, in order to retain the auxiliary sealing device in its sealing position. The container may be a drinks can (10, fig 2), and the non-resealable closure device may be a ring pull with finger ring 16. The auxiliary sealing device may be spring biased to automatically seal the can once the non-resealable ring pull has been removed. For instance it may be a leaf spring 23 attached to a support 25 that fully extends beneath the opening, on which is mounted an annular synthetic foam sealing member that seals the auxiliary sealing device to the top of the can 12, once opened. The retaining means may be a stud 27, on the upper face of the auxiliary sealing device, slidable between two positions to allow the can user access to the contents of the can, or retain the auxiliary seal in its sealing position (fig 7).

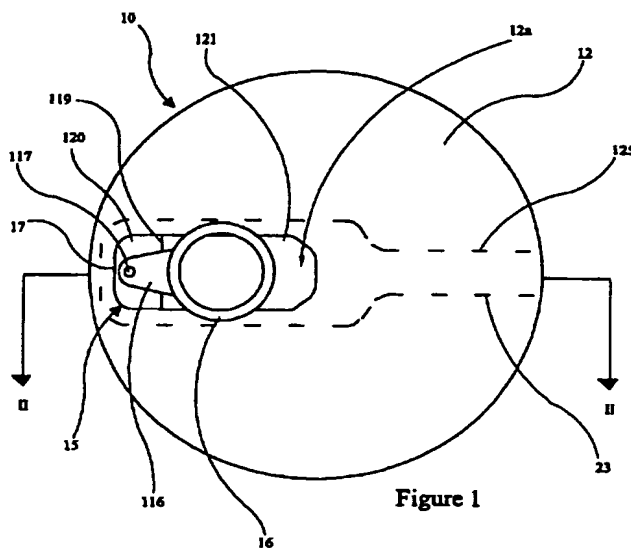


Figure 1

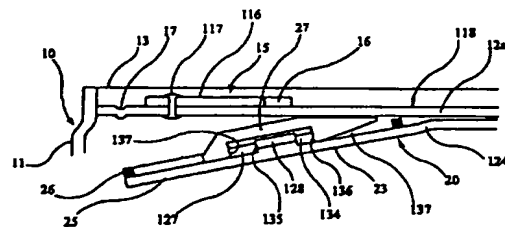


Figure 2

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

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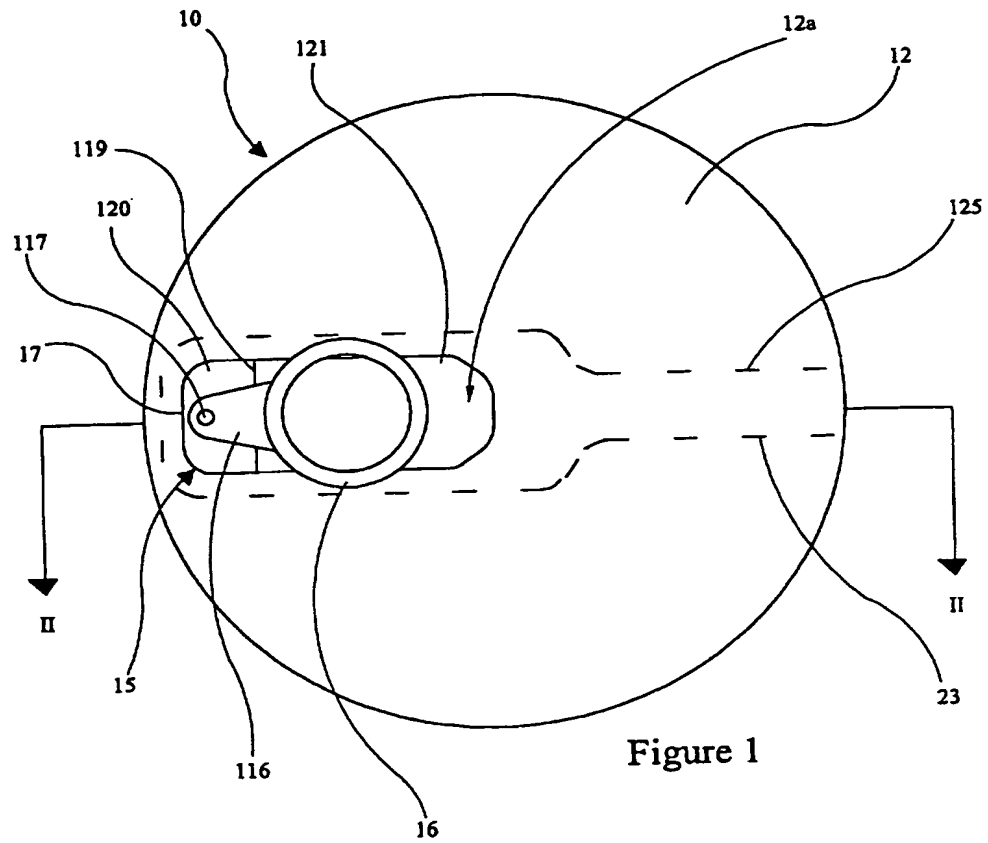


Figure 1

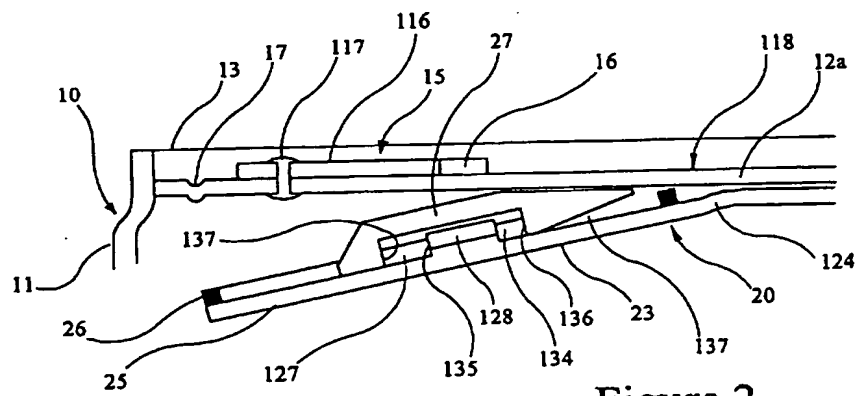
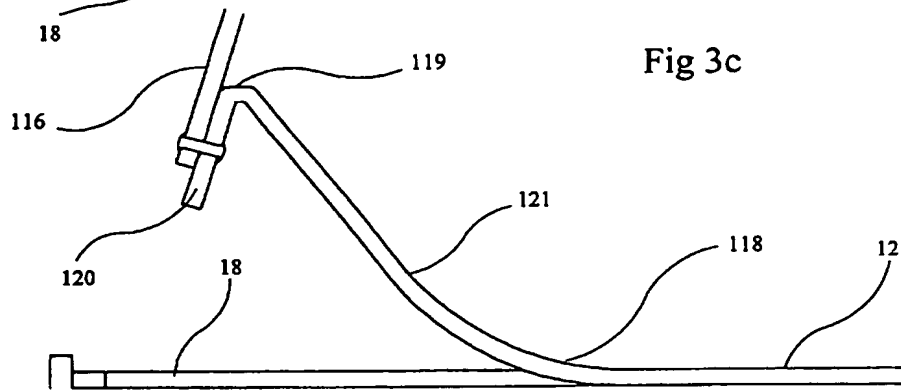
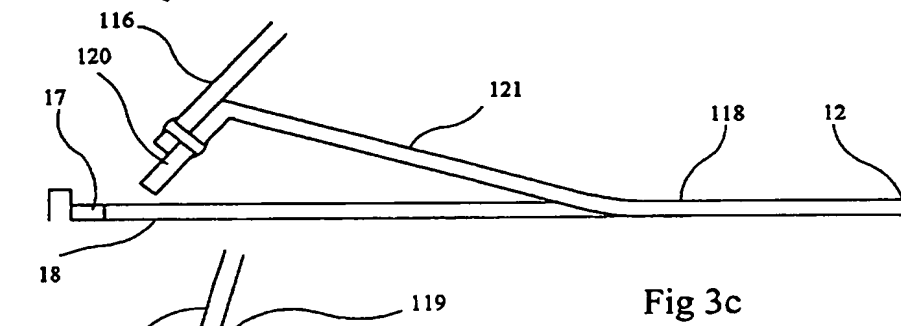
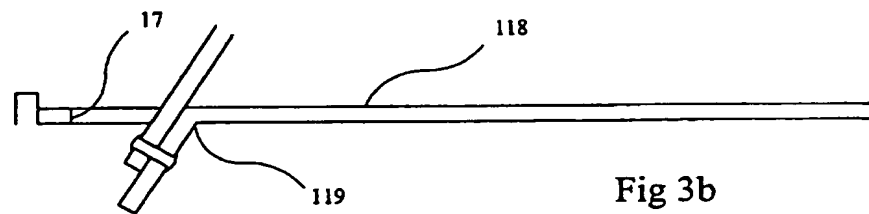
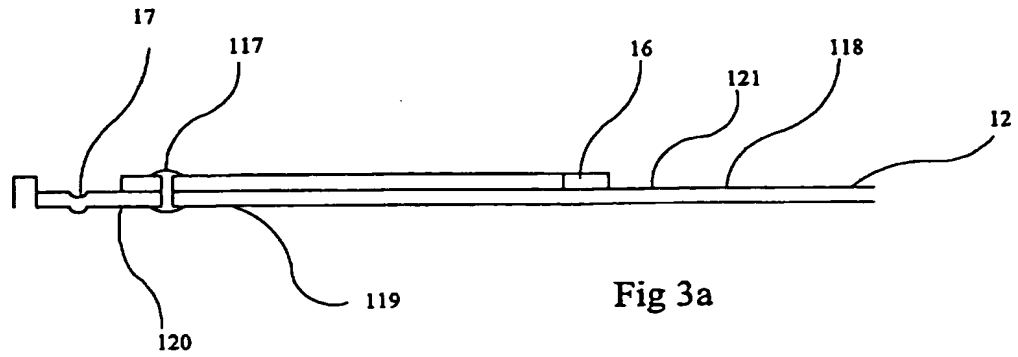
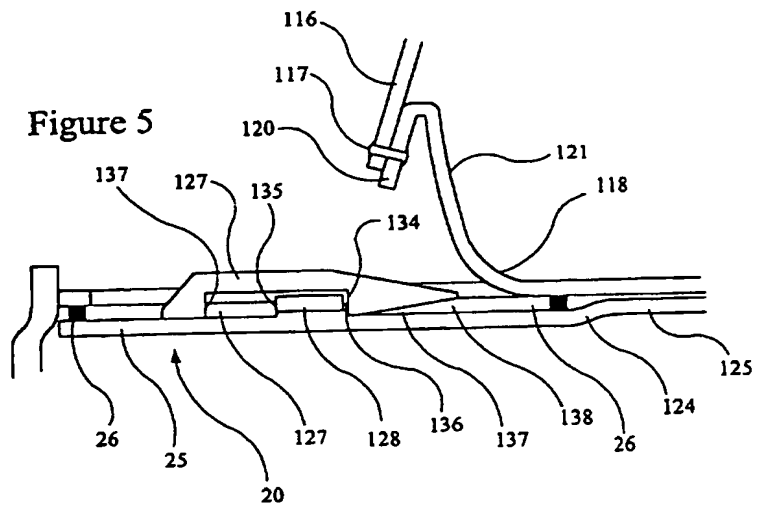
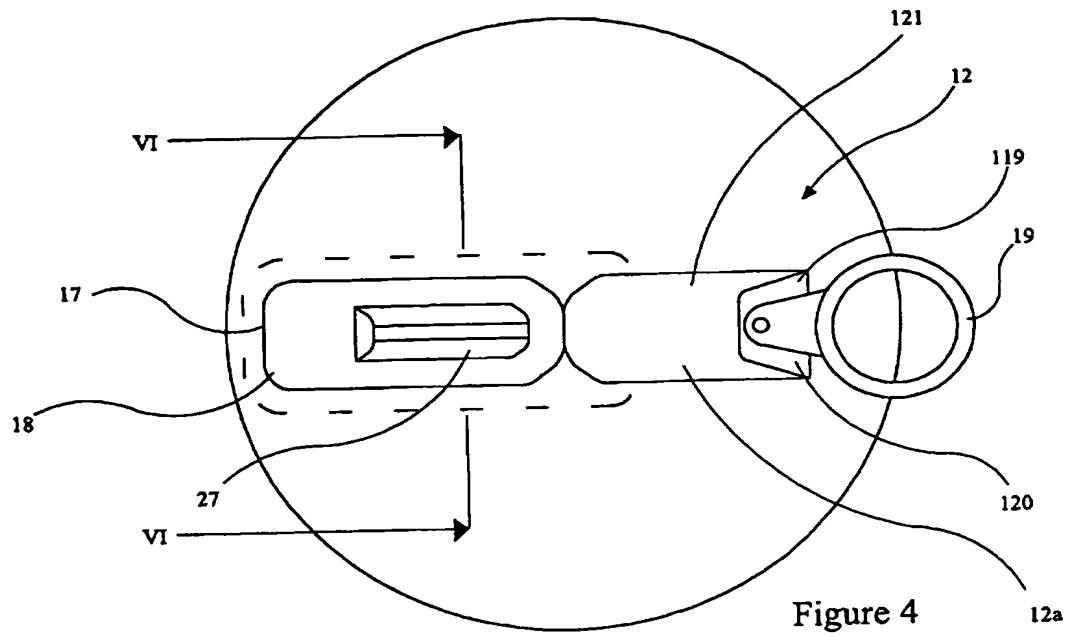
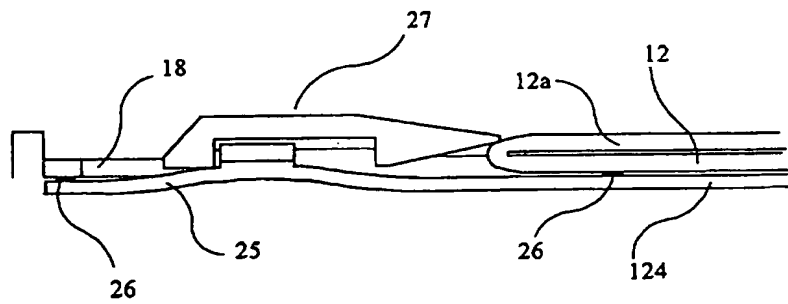
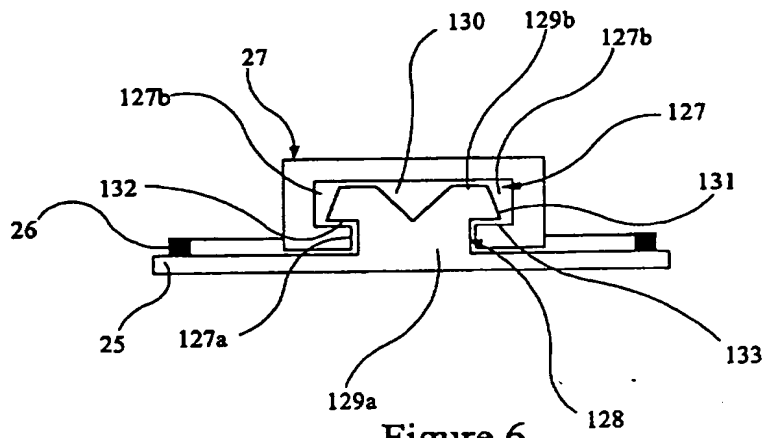


Figure 2







IMPROVED CONTAINER SEAL AND AN IMPROVED SEALABLE
CONTAINER

The present invention relates to seals for containers
5 particularly for containers such as drinks cans.

Current drinks cans often have a small opening in their
flat top which is closed prior to sale by an integral
tongue, or tear tab, of the can metal which is joined to
10 the major part of the top by a line of weakness. The
tongue can be torn from the can around the line of
weakness by a force exerted on a metal loop, or so-called
ring pull, the tongue preferably being retained by a
metal bridge between two ends of the line of weakness so
15 that it cannot be thrown away separately to add to known
litter problems.

One problem with many such cans is that, once the seal
has been broken by tearing of the tongue, the can is no
20 longer resealable and all the contents must be consumed
fairly quickly both to avoid the risk of spillage and to
avoid the loss of sparkle if the drink is carbonated
because the drink will not remain palatable for long
after the can has been opened. Moreover, if, as is
25 usually the case, the drink is carbonated and the can has
been shaken or warmed, the drink often spurts out of the
can when it is opened.

A previous patent application of the Applicant published under No. GB9603357.6, provided a solution to this problem in the form of an auxiliary sealing device operable to seal the can opening once the ring pull closure device has been opened. The object of the present invention is to provide an improved form of such an auxiliary sealing device. Accordingly the invention provides a container having an opening closed by a non-resealable closure device, the container further carrying within it an auxiliary sealing device operable to seal the opening once the closure device has been unsealed and further including retaining means operable from outside the container once the non-resealable closure device has been opened to retain the auxiliary sealing device in its sealing position.

As in the Applicant's earlier device, the auxiliary sealing device is adapted to be fitted inside a container and preferably includes a sealing member for sealing the opening formed on removal of the non-reusable closure.

Although the sealing member may comprise a plug which is a close, possibly a resilient, fit in the opening, it preferably seals against an inner surface of the container around the opening formed by removal of the closure device. This inner surface should therefore be clear of obstruction if the auxiliary closure device is to be simple and not too cumbersome. The auxiliary seal and retaining means of the invention may be applied to

drinks cans with ring pull seals which are removable completely from the opening but will be described below, without thereby limiting the scope of the invention, to cans having ring pull seals which are pulled to the exterior of the can and retained by a metal bridge.

The auxiliary sealing device of the invention may be made at least partly integral with the can itself or may be manufactured separately and subsequently attached to the can. It may be attached so that its sealing member is normally located in a non-sealing position while the can is closed by its ring pull seal. Alternatively, it may be supported in a position in which the sealing member seals the opening even when the can is closed by the ring pull seal. It may be moved into its sealing position immediately and automatically when the can is opened, for example by auxiliary biasing means and/or by the pressure of the can contents if these are pressurised. Alternatively the auxiliary sealing member may operate only if the can is tilted, or it may be movable into its sealing position by the user.

If it is required to seal the can only when the can is full of liquid, on first opening, or when the can is tilted in such a direction that the contents move to the opening, the auxiliary sealing device may include or comprise a float valve. Such a valve would not, however, protect the contents from the air when the can was half-

full and upright and it is preferred to employ a sealing device having a member which is urged into sealing engagement with the opening whatever the orientation of the can. Resilient biasing means are preferred.

5

Various spring-biased devices using coil springs or resilient blocks may be envisaged for biasing a sealing member to close a can opening but a leaf spring is preferred for simplicity and economy of manufacture particularly in this field where the leaf spring may be of the same material as the can. Such a leaf spring may serve both to bias the sealing member into its sealing position and to attach it to the can, the sealing member being carried at or adjacent one end of the spring while the spring is attached to the can at or adjacent its other end. The spring is preferably attached to the can top containing the opening. The sealing member itself preferably comprises a compressible, liquid- and gas-tight washer-like member which is pressed by the biasing means against the metal surrounding the can opening. Such a washer-like member is preferably of a synthetic foam rubber.

It will be understood that, although the sealing member may normally be urged into or towards its sealing position by the resilient biasing means, it must be possible for the user to move it away from this position to gain access to the contents. The biasing force

should, therefore, be sufficiently weak for the user to force the sealing member easily away from the opening, for example, with a straw or with his lip or tongue if he wishes to drink directly from the can. In a preferred
5 embodiment of the invention the sealing member carries a stud which projects through the can opening when the ring pull seal has been removed and which can be engaged by the user's lip or tongue to force the auxiliary sealing member into the can when the user wishes to drink.

10

With regard to the retaining means of the container of the invention, their form may depend on the nature of the auxiliary sealing device. They preferably comprise a member carried by the auxiliary sealing device so as to
15 be housed inside the can while the non-resealable closure device is in place but which is presented so as to be available to the user when the can is opened. The retaining member may be usable to pull the sealing member into its sealing position if it is not biased into this
20 position but is also usable to retain the sealing member in this position. For this purpose it is preferably movable by the user into engagement with a part of the can, most conveniently, the part of the can surrounding the opening, to draw the sealing member firmly into its
25 sealing position and to lock it in this position. The retaining member may, for example, comprise a grip member projecting upwardly from the sealing member so that it can be pulled up by the user to pull the sealing member

into its sealing position and which may then be moved into its retaining position.

5 The engagement of the grip member with the can may be achieved in various ways. The grip may, for example, comprise a lever pivotally mounted at one end on the sealing member for pivoting about an axis parallel to the can opening and pivotable by the user into a position in which its free end engages the top of the can, resilient
10 biasing means being provided to urge the lever into this position and simultaneously cause a reactive force to be exerted on the end attached to the sealing member to urge the latter into its sealing position.

15 In an alternative embodiment, the grip may comprise or include a T-member, the stem of which is captive on the sealing member for rotation about an axis perpendicular to the can opening and the head of which, when in the can, extends generally parallel to a longer axis of the
20 can opening. When the non-reusable closure is removed, the head of such a T-member may be rotated so that its ends engage the upper surface of the can top on either side of the opening to retain, or lock, the sealing member in its sealing position.

25

The present invention is particularly concerned with a drinks can having a ring pull tab in which the tab is elongate and is torn from the can top towards the centre

of the top and is retained by an integral bridge adjacent the centre and in which the auxiliary sealing device comprises an annular sealing member supported on a plate-like member within the can so that it can seal against the inside of the can top surrounding the opening when this is formed. A lever or T-member as described above would be usable in this situation, being mounted on the plate-like support member, but the retaining means of the container of the invention preferably comprises a slide member engaged with a guide on the upper surface of the plate-like member for sliding movement between a position generally central of the member towards a position in which an end part overlies a portion of the can top surrounding the opening in such a manner as to retain the sealing device in sealing engagement with the can top. The slide member may slide towards the periphery of the can but, more preferably, slides towards that end of the can opening at which the tear tab is still attached, its end portion engaging over the tear tab itself to press this down against the can top.

The invention further comprises an auxiliary sealing device and retaining means as described above for a container having an opening closed by a non-resealable closure device.

One embodiment of the invention will now be further described, by way of example, with reference to the

accompanying drawings, in which:

Figure 1 is a top plan view of a drinks can fitted with a ring-pull seal and an auxiliary sealing device and retaining device according to the invention;

5 Figure 2 is an enlarged vertical section taken on the line II-II of Figure 1;

Figures 3a to 3d show, schematically, stages in the breaking of the ring pull seal of Figures 1 and 2, the auxiliary sealing device being omitted for clarity of
10 illustration;

Figure 4 is a view similar to Figure 1 but showing the ring pull seal broken;

Figure 5 is a view similar to Figure 2 but showing the ring pull seal broken; and

15 Figure 6 is a sectional view of the auxiliary sealing device taken on the line VI-VI of Figure 4.

Figure 7 is a view similar to Figure 5 but showing the retaining device retaining the auxiliary sealing device in a locked condition.

20

With reference to the drawings, a drinks can shown generally indicated 10 comprises, in known manner, a cylindrical wall 11 (see Figure 2) closed at each end by respective top and bottom circular metal sheets, only the
25 top sheet 12 of which is shown. The top 12 is sealed to the wall 11 in any known manner and is shown in Figure 2 surrounded by an upstanding rim 13 of the cylindrical wall 11 not shown in Figure 1 for clarity of

illustration. The can 10 is of such a construction that it can contain a carbonated drink, the can being filled and the top 12 being applied and sealed to the wall 11 under pressure.

5

The can 10 is openable by means of a ring pull closure device or seal 15 comprising a finger ring 16 attached by a tab 116 and a rivet 117 to a tongue 12a extending diametrally of, and forming an integral part of, the top 10 12 but joined to the remaining part of the top 12 by a line of weakness 17 which surrounds it except for a short discontinuity 118 at one end. This discontinuity 118, forming an attached end of the tongue 12a, lies substantially at the centre of the top 12 while the rivet 15 117 attaching the ring pull 16 is adjacent the opposite end of the tongue 12a, near the periphery of the can 10.

The ring 16 can be manipulated to form an opening 18 in the top 12 in a manner which will be described below with reference to Figures 3a to 3d. As shown in these 20 drawings, which show only the top 12 for clarity of illustration, the tongue 12a has an additional line of weakness 119 which extends transverse the tongue 12a between the rivet 117 and the attached end 118 but close to the rivet 117: the line 119 thus divides the tongue 25 12a into two parts, a smaller portion 120 carrying the ring 16 and a larger portion 121 extending to the discontinuity, or attached end, 118.

The line of weakness 119 comprises a fold line such that, when the ring 16 is lifted from the position shown in Figure 3a to that shown in Figure 3b, the ring attachment at the rivet 117 forces the smaller portion 120 of the tongue 12a into the can 10, the tearline 17 tearing along the periphery of this smaller portion 120. From this position, Figure 3b, the ring can then be pulled upwardly to continue the tearing along the remainder of the tear line 17 through the position shown in Figure 3c. When the tears along the two longer sides of the tongue 12a reach the discontinuity 118, tearing stops (Figure 3d) and the tongue 12a can be folded back, away from the opening 18.

With reference now particularly to Figures 2, 4 and 6 of the drawings the can 10 further includes a spring-biased sealing device generally indicated 20 for sealing the opening 18 after the tongue 12a has been torn around its line of weakness 17. The device 20 includes a leaf spring 23 comprising an elongate resilient blade attached at one end (not shown) to the inner surface of the top 12 of the can adjacent the periphery of the can 10 and extending generally diametrically across the can 10 in line with the tongue 12a and close beneath the top 12. In more detail, the blade comprises a wider seal-support portion 25, of such a size and shape that it extends fully across the opening 18, connected by an elbow portion 124 to a narrower stem 125, the opposite end (not shown) of which

is attached to the top 12.

The seal-support portion 25 carries an annular synthetic-foam sealing member 26 on its upper face facing the top 12. The sealing member 26 is of the same peripheral shape as the opening 18 but of a slightly larger size such that it can seat against the part of the top 12 surrounding the opening to form a seal therewith.

The Seal-support 25 also carries a stud 27 on the same surface as the sealing member 26 and inside it. When the can 10 is closed, with its top 12 intact, the stud 27 contacts the underside, or inner surface, of the tongue 12a, as shown in Figure 2. In this condition the leaf spring 23 is stressed and urges the seal-support 25 towards the top 12. When the tongue 12a is torn by means of the ring 16, the leaf spring 23 is able to press the sealing member 26 against the inner surface of the top 12, sealing the can opening 18, with the stud 27 projecting upwardly through this opening: this situation is shown in Figures 4 and 5. The sealing action is enhanced by the incorporation of the elbow 124 in the leaf spring 17 as this supports the wider seal-support portion 25 spaced slightly from the top 12 in such a manner that the sealing member 126 is pressed firmly and evenly against the top 12 around the entire periphery of the opening 18.

The can and its closure described above is substantially the same as that described in the applicant's prior U.K Patent Application but the embodiment shown in the drawings incorporates one main improvement. Whereas in
5 the prior art the stud is fixed to the leaf spring 23, the stud 27 described here is captive on the seal-support portion 25 but slidable longitudinally thereof.

More specifically, as shown particularly in Figures 2, 4,
10 5 and 6, the stud 27 comprises a generally rectangular-section, elongate block with shaped ends arranged with its longitudinal axis parallel to the axis of the seal-support 25. The block 27 has a closed-ended, T-section channel 127 formed in its under face whereby it engages
15 a cooperatively-shaped upstanding guide member 128 on the upper face of the seal-support 25, the guide member 128 extending longitudinally thereof to guide the stud 27 for its sliding movement between two travel limit positions described below.

20

In more detail, the guide member 128, in section, has an upstanding stem 129 divided by a V-shaped groove 130, extending into it from its upper face, into two mirror-imaged limbs 129a each of which carries an outwardly
25 projecting head 129b at its free end: the two heads 129b engage in the two branches 127b of the head of the T-shaped channel 127 while the stem 129 is a close fit in the stem 127a of the T shape.

The guide member 128 has sufficient resilience to allow the limbs 129a to deform towards each other to enable them to be snap-engaged in the channel 127 of the stud 27 during assembly of the device, the heads 129b of the guide member also having bevelled faces 131 to facilitate the insertion of the guide member into the channel. Once the guide member 128 is engaged with the channel 127, faces 132 of its projecting heads 129b, which face the seal-support 25, engage opposing shoulders 133 of the T-section branches 127b to oppose the separation of the guide member 128 and the stud 27.

In use, the stud 27 is slidable on the seal-support 25 between two end positions defined by the engagement of end faces 134, 135 of the guide member 128 with respective end faces 136, 137 of the T-section channel 127. In the first end position shown in Figure 5, the stud is located generally centrally of the seal-support 25. The stud is slidable from this position towards the centre of the can top 12 to the end position shown in Figure 7. In sliding towards this second position, the end of the stud 27 nearer the can centre encounters the end of the tear tongue 12a where it is attached to the can top 12 at the line 118. The under end face 137 of the stud 27 is bevelled so as to define a gap 138 between it and the seal support 25 such that the stud 27 can be forced over the tear tongue 12a, pressing this down against the can top 12, the tongue 12a and top 12 being

inserted in the gap 138 as shown in Figure 7.

The force-fitting of the stud 27 over the tear tab 12a thus serves to press the latter against the top 12 so that a fold is formed along the line 118 and the tab lies more conveniently against the top 12. It also draws the seal-support 25, and more particularly, the sealing member 26 more tightly against the under side of the top 12 so as to improve the sealing achieved. Moreover the stud 27 and the seal-support 25 grip the top 12 and tear tab 12a between them so as to retain the seal support in its sealing position.

In use of the drinks can described above, when the user first tears the tear tab the auxiliary sealing device automatically seals the can due to the resilience of the leaf spring.

When the user of the can 10 wishes to drink from the can, he can press the seal support 15 into the can 10 so as to unseal the opening 18 either with the aid of an implement, such as a straw, or by pressing the stud 27 with his upper lip. After sufficient drink has been withdrawn, he may then remove the pressure on the seal support 25 at which time the leaf spring 23 will return the sealing member 26 into sealing contact with the top 12 to retain any remaining drink in the can. The sealing action can then be enhanced by the sliding of the stud 27

into its position in which it presses the tear tab 12a against the can top 12 as described above.

When the user again wishes to drink from the can, the
5 stud 27 can be slid back to its initial position to allow the seal support 25 to be pushed into the can again. The manipulation of the stud 27 is facilitated by the provision of ridged, roughened and/or bevelled surfaces at its ends.

CLAIMS

1. A container having an opening closed by a non-resealable closure device, the container further carrying
5 within it an auxiliary sealing device operable to seal the opening once the closure device has been unsealed and retaining means operable from outside the container once the non-resealable closure device has been unsealed to retain the auxiliary sealing device in its sealing
10 position.

2. An auxiliary sealing device adapted to be fitted within a container having a non-resealable closure device, the sealing device being capable of sealing the
15 opening closed by the closure device once the latter has been unsealed and retaining means carried by the auxiliary sealing device for retaining the auxiliary sealing device in its sealing position.

Amendments to the claims have been filed as follows

1. A container having an opening closed by a non-resealable closure device, the container further carrying
5 within it an auxiliary sealing device having a sealing member for sealing the opening after removal of the non-resealable closure device, the auxiliary sealing device being operable to seal the opening once the closure
10 device has been removed, and further including retaining means operable from outside the container after the non-resealable closure device has been opened, whereby to retain the auxiliary sealing device in its sealing position.
- 15 2. A container as claimed in Claim 1, wherein the sealing member of the auxiliary sealing device comprises a plug which resiliently fits the said opening.
3. A container as claimed in Claim 1 or Claim 2,
20 wherein the sealing member of the auxiliary sealing device seals against an inner surface of the container around the opening formed upon removal of the closure device.
- 25 4. A container as claimed in any of Claims 1 to 3, wherein the auxiliary sealing device is at least partly integral with the container.

5. A container as claimed in any preceding claim, wherein the auxiliary sealing device is manufactured separately and subsequently attached to the container.

5 6. A container as claimed in any preceding claim, wherein the auxiliary sealing device is attached in such a way that its sealing member is normally located in a non-sealing position when the container is closed by the closure device.

10

7. A container as claimed in any preceding claim, wherein the auxiliary sealing device is supported in a position in which the sealing member thereof seals the opening even when the container is closed by the closure
15 device.

8. A container as claimed in Claim 6, further including auxiliary biasing means operable to move the sealing member into its sealing position immediately and
20 automatically upon opening of the container.

9. A container as claimed in any preceding claim, wherein the sealing member of the auxiliary sealing means operates only if it is deliberately moved into position
25 by a user.

10. A container as claimed in any preceding claim, wherein the sealing member of the auxiliary sealing

device incorporates resiliently biased closure means such as spring biased devices, coil springs, resilient blocks, leaf springs or the like.

5 11. A container as claimed in Claim 10, wherein the resilient biasing means is a leaf spring which serves both to bias the sealing member into its sealing position and to attach it to the container, the sealing member being carried at or adjacent one end of the leaf spring,
10 the other end of the leaf spring being attached to the container.

12. A container as claimed in Claim 11, wherein the container is a can and the leaf spring is attached to a
15 top end of the can in which the opening is formed.

13. A container as claimed in any preceding claim, wherein the sealing member of the auxiliary sealing device comprises a compressible, liquid-tight and gas-
20 tight washer-like member which is pressed by the resilient biasing means against the rim of the opening in the top end of the can.

14. A container as claimed in Claim 13, wherein the
25 washer-like member is made of a synthetic elastomer.

15. A container as claimed in any preceding claim, wherein the sealing member of the auxiliary sealing

device carries a projection which extends through the opening when the closure device has been removed, to allow engagement by the lip or tongue of a user whereby to press the auxiliary sealing device into the container
5 to allow liquid to be withdrawn therefrom.

16. A container as claimed in any preceding claim, wherein the retaining means comprise a member carried by the auxiliary sealing device so as to be housed inside
10 the container while the non-resealable closure device is in place, and which is made available to a user when the non-resealable closure device is opened.

17. A container as claimed in Claim 16, wherein the
15 retaining member is usable to pull the sealing member of the auxiliary sealing device into its said sealing position whereby to retain the sealing member in position sealing the opening.

20 18. A container as claimed in Claim 17, wherein the retaining means is movable by the user into engagement with a part of the container, whereby to draw the sealing member firmly into its sealing position and to retain it securely in this position.

25

19. A container as claimed in Claim 18, wherein the retaining member comprises a grip member projecting upwardly from the sealing member such that it can be

pulled up by a user to pull the sealing member into its sealing position, in which position it is movable into its retaining position.

5 20. A container as claimed in Claim 19, wherein the grip is a lever pivotally mounted at one end on the sealing member for pivoting about an axis parallel to the opening in the container and pivotable by the user into a position in which its free end engages the part of the
10 container in which the opening is formed.

21. A container as claimed in Claim 20, wherein there are further provided resilient biasing means acting to urge the lever into the said engagement position thereof
15 and simultaneously cause a reactive force to be exerted on the end thereof attached to the sealing member whereby to urge the latter into its sealing position.

22. A container as claimed in Claim 20, wherein the grip
20 comprises a T-shape member the stem of which is captive on the sealing member for rotation about an axis perpendicular to the opening, and the head of which, when in the interior of container, extends generally parallel to a longer axis of the opening.

25

23. An auxiliary sealing device for a container having an opening closed by a non-resealable closure device, the auxiliary sealing device comprising means acting to seal

the opening in the container once the non-resealable
closure device has been removed, and further including
retaining means operable from outside the container once
the closure device has been removed, whereby to retain
5 the auxiliary sealing device in a sealing position
thereof.



Application No: GB 9723984.2
Claims searched: 1-23

Examiner: INVESTOR IN PEOPLE
Gareth Prothero
Date of search: 9 February 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK CI (Ed.Q): B8D (DCF11, DCF12, DCF13, DCE, DCG); B8T (TWG, THMX)
Int CI (Ed.6): B65D 17/00
Other: Online: EDOC and WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	US 5096082 A (HOEFLER) see figs 2 to 5, and col 3, lines 36 to 66.	1-5, 7, 8, 10-14, & 23
X	US 4681238 A (SANCHEZ) see abstract, and figs 8 to 12.	1-6, 9, 13, 14, & 23

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.